

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference AX02A03 / P-WO	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, Item 5 below.	
International application No. PCT/EP2004/007529	International filing date (day/month/year) 08/07/2004	(Earliest) Priority Date (day/month/year) 08/07/2003
Applicant AXIOGENESIS AG		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 9 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. ☒ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☒ **Certain claims were found unsearchable** (See Box II).

3. ☐ **Unity of invention is lacking** (see Box III).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the **drawings** to be published with the abstract is Figure No. _____

☐ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

- b. ☒ none of the figures is to be published with the abstract.

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Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of Item 1.b of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, the international search was carried out on the basis of:
- a. type of material
- ☒ a sequence listing
- ☐ table(s) related to the sequence listing
- b. format of material
- ☒ in written format
- ☒ in computer readable form
- c. time of filing/furnishing
- ☒ contained in the international application as filed
- ☒ filed together with the international application in computer readable form
- ☐ furnished subsequently to this Authority for the purpose of search
2. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
3. Additional comments:

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12N5/06 C12N15/79 C12N15/82 C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C12N C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/008836 A1 (GOLDSPINK GEOFFREY) 9 January 2003 (2003-01-09)	1,2,5-7, 10,13, 14,16, 17,20, 32-36,49
Y	paragraph '0053! - paragraph '0057! table 1 ----- -/-	3,4,8,9, 11,12, 15,18, 19, 21-31, 37-48

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

15 February 2005

Date of mailing of the international search report

16/03/2005

Name and mailing address of the ISA

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	MUELLER M ET AL: "Selection of ventricular-like cardiomyocytes from ES cells in vitro" FASEB JOURNAL, FED. OF AMERICAN SOC. FOR EXPERIMENTAL BIOLOGY, BETHESDA, MD, US, vol. 14, no. 15, December 2000 (2000-12), pages 2540-2548, XP002180458 ISSN: 0892-6638	49-54 ✓
Y	abstract page 2543, left-hand column, paragraph 2 - page 2544, left-hand column, last line page 2545, right-hand column, paragraph 3 - page 2547, left-hand column, last paragraph page 2541, left-hand column - right-hand column	1-48
X	----- WOBUS A M ET AL: "RETINOIC ACID INDUCES EXPRESSION OF THE VENTRICULAR 2.1 KB MYOSIN-LIGHT-CHAIN-2 PROMOTER DURING IN VITRO CARDIOGENESIS OF EMBRYONIC STEM CELLS" CIRCULATION, AMERICAN HEART ASSOCIATION, DALLAS, TX, US, vol. 92, no. 8, SUPPL 1, 15 October 1995 (1995-10-15), page I114, XP002001047 ISSN: 0009-7322	49-54 ✓
Y	abstract	1-48
X	----- WOBUS A M ET AL: "RETINOIC ACID ACCELERATES EMBRYONIC STEM CELL-DERIVED CARDIAC DIFFERENTIATION AND ENHANCES DEVELOPMENT OF VENTRICULAR CARDIOMYOCYTES" JOURNAL OF MOLECULAR AND CELLULAR CARDIOLOGY, XX, XX, vol. 29, no. 6, 1997, pages 1525-1539, XP001030714 ISSN: 0022-2828	45-47, 49-54 ✓
Y	page 1527, left-hand column, paragraph 2 page 1527, left-hand column, last paragraph - right-hand column, paragraph 1 page 1529, left-hand column, paragraph 1 figure 1	1-44, 48
X	----- KLUG M G ET AL: "GENETICALLY SELECTED CARDIOMYOCYTES FROM DIFFERENTIATING EMBRYONIC STEM CELLS FORM STABLE INTRACARDIAC GRAFTS" JOURNAL OF CLINICAL INVESTIGATION, NEW YORK, NY, US, vol. 98, no. 1, 1 July 1996 (1996-07-01), pages 216-224, XP000670716 ISSN: 0021-9738	49-54 ✓
Y	the whole document	1-48
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	BRONSTEIN I ET AL: "CHEMILUMINESCENT REPORTER GENE ASSAYS: SENSITIVE DETECTION OF THE GUS AND SEAP GENE PRODUCTS" BIOTECHNIQUES, EATON PUBLISHING, NATICK, US, vol. 17, no. 1, 1994, pages 172-174, 176-177, XP009011110 ISSN: 0736-6205 page 172, right-hand column, paragraph 2 - page 173, left-hand column, paragraph 1 page 174, left-hand column, last paragraph - page 174, right-hand column, paragraph 1 page 175, left-hand column, last paragraph - page 175, right-hand column, paragraph 1	1-48
X	US 2002/042096 A1 (ROSEN CRAIG A ET AL) 11 April 2002 (2002-04-11)	1,2,9,14
Y	examples 34-36 paragraph '0491! paragraph '0807!	3-8, 10-13, 15-48
Y	WO 98/49320 A (AHLUWALIA NAVNEET K ; BENKEL BERNHARD F (CA); FALCONER MARCIA M (CA) 5 November 1998 (1998-11-05) cited in the application the whole document	9
X	HUNTER J J ET AL: "VENTRICULAR EXPRESSION OF A MLC-2V-RAS FUSION GENE INDUCES CARDIAC HYPERTROPHY AND SELECTIVE DIASTOLIC DYSFUNCTION IN TRANSGENIC MICE" JOURNAL OF BIOLOGICAL CHEMISTRY, AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, BALTIMORE, MD, US, vol. 270, no. 39, 1 September 1995 (1995-09-01), pages 23173-23178, XP002001049 ISSN: 0021-9258 page 23174, paragraph 1	49-54
A	LIU HSIAO-SHENG ET AL: "Is green fluorescent protein toxic to the living cells?" BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, vol. 260, no. 3, 14 July 1999 (1999-07-14), pages 712-717, XP002257794 ISSN: 0006-291X cited in the application the whole document	1-54

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 95/14079 A (INDIANA UNIVERSITY FOUNDATION) 26 May 1995 (1995-05-26) the whole document	1-54 ✓
A	----- GUAN K. ET AL.: "Embryonic stem cells in vitro - Prospects for cell and developmental biology, embryotoxicology and cell therapy" ALTEX, vol. 16, no. 3, 1999, pages 135-141, XP009018838 cited in the application the whole document	1-54 ✓
A	----- METZGER JOSEPH M ET AL: "Vital staining of cardiac myocytes during embryonic stem cell cardiogenesis in vitro" CIRCULATION RESEARCH, GRUNE AND STRATTON, BALTIMORE, US, vol. 78, no. 4, 1996, pages 547-552, XP002213275 ISSN: 0009-7330 cited in the application the whole document	1-54 ✓
A	----- ROHWEDEL J ET AL: "EMBRYONIC STEM CELLS AS AN IN VITRO MODEL FOR MUTAGENICITY, CYTOTOXICITY AND EMBRYOTOXICITY STUDIES: PRESENT STATE AND FUTURE PROSPECTS" TOXICOLOGY IN VITRO, ELSEVIER SCIENCE, GB, vol. 15, no. 6, 2001, pages 741-753, XP001027083 ISSN: 0887-2333 the whole document	1-54 ✓
A	----- WO 02/051987 A (FLEISCHMANN BERND ;HESCHELER JUERGEN (DE); AXIOGENESIS AG (DE); B0) 4 July 2002 (2002-07-04) cited in the application the whole document	1-54 ✓

INTERNATIONAL SEARCH REPORT

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Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: —
because they relate to subject matter not required to be searched by this Authority, namely:
Although claim 44 relates to a method of doing business (Rule 39.1 (iii) PCT) the search has been performed without taking into account the business-related part of the claim, i.e. step c).
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP2004/007529

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2003008836	A1	09-01-2003	EP 0977879 A2	09-02-2000
			WO 9849333 A2	05-11-1998
			JP 2001523106 T	20-11-2001
			US 2002025577 A1	28-02-2002
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			AU 2950801 A	07-08-2001
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			AU 3972701 A	07-08-2001
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			AU 4140201 A	07-08-2001
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			AU 4313701 A	14-08-2001
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			WO 9849320 A1	05-11-1998

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Information on patent family members

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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			AU 1097695 A	06-06-1995
			AU 697666 B2	15-10-1998
			AU 5214198 A	19-03-1998
			CA 2174860 A1	26-05-1995
			EP 0729506 A1	04-09-1996
			JP 9505471 T	03-06-1997
			JP 2004344170 A	09-12-2004
			WO 9514079 A1	26-05-1995
			US 6399300 B1	04-06-2002
			US 5733727 A	31-03-1998
			US RE37978 E1	04-02-2003
			US 2004265287 A1	30-12-2004
			US 2001038837 A1	08-11-2001
			US 2002061295 A1	23-05-2002
WO 02051987	A	04-07-2002	DE 10136702 A1	18-07-2002
			BR 0116549 A	23-12-2003
			CA 2431197 A1	04-07-2002
			CN 1483074 T	17-03-2004
			WO 02051987 A1	04-07-2002
			EP 1348019 A1	01-10-2003
			GB 2386609 A , B	24-09-2003
			JP 2004520029 T	08-07-2004
			US 2004096432 A1	20-05-2004